

## Technological Innovation and Organizational Performance

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### Abstract

For any organization to succeed, it should be able to compete within its market, and attempt to rub shoulders with other competitors in the international frontiers. The study seeks to investigate the effect of technological innovation of organizational performance of Dangote Plc, Ibesse Plant, Ogun State. The objective of the study was decomposed to find out the impact of Strategic planning capability & Marketing Planning Capability on Organizational Performance. A descriptive survey design was adopted for this study. A sample size of 96 employees in the study area were conveniently selected by the researcher to aid effective result. A structured questionnaire was utilised to collect the needed data from the respondents. The collected data was analysed using simple percentage statistics while the hypotheses were tested using linear regression analysis. The finding of the study revealed that strategic planning capability and marketing capability have positive relationship with organizational performance ( $p= 0.000$ ). Following the findings of the study, it was recommended that there should be pragmatic strategic planning capability in order to deliver superior performance and ultimately sustained competitive advantage.

**Keywords:** *Innovation, Marketing Planning, Organizational performance, Strategic Planning, Technology*

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### **Background to the Study**

Technological innovation is more and more important for an organization in a competitive and dynamic environment. Technology, as an intangible asset, is becoming a critical factor for the survival and competition among companies. Zahra and Bogner (2000) suggest that technological innovation may have an impact on the industry's structure or competitive advantage, as well as being an important edge for a company willing to challenge a well-established competitor. Therefore, the widespread application of technology can be an important factor in structuring an industry, technological innovation can provide a competitive advantage for a company or even increase the profitability of all the companies within the industry. For any organization to succeed, it should be able to compete within its market, and attempt to rub shoulders with other competitors in the international frontiers. The organization must imbibe the culture of innovation because of its importance as confirmed in many studies (Daniels, 2002; Gelende and Fuente, 2003).

Unfortunately, Nigerian manufacturers find it difficult to stand against its competitors from foreign countries. The local companies cannot compete with the foreign counterparts in terms of product quality and other areas of marketing capabilities. The foreign firms have strategic plan as a tool-kit for achieving their feet, which is also lacking among the domestic manufacturers. The resultant effect is while the local industries performance is on the decline, the multinationals are booming.

### **Objective of the Study**

The broad objective of the study is to evaluate the impact of technological innovation on Organization performance.

In order to pursue the broad objective of this study, the following hypothetical statements are put forward to give a direction to this study:

H<sub>01</sub>: Information technology does not have any effect on strategic planning capability

H<sub>02</sub>: Product innovation does not have an effect on marketing capabilities.

### **Literature Review**

#### **Conceptual Framework**

##### **Technological Innovation Concept and Innovation Process**

Technological innovation is underdetermined – there is no single “best solution”. To state that technological innovation is underdetermined is to say that “technical principles are insufficient by themselves to determine design” Feenberg, (1995). The research traditions mentioned above subscribe to the view that the “natural attributes” of technology are not sufficient to explain technological innovation, though they differ in the importance they attach to this belief. For the social shaping of technology theorists, the belief that technological innovation does not unfold according to some predetermined technical logic is critical (Williams & Edge, 1996). The particular path that technological innovation takes is something to be explained, rather than simply adjusted to. Studies of the management of innovation, and innovation adoption, acknowledge that the seemingly “best” technology does not always become the most widely accepted Utterback, (1994).

While the economists of innovation believe that technological “trajectories” make some innovation paths more likely than others (Dosi, 2005), the complex interplay between technological supply and market demand cannot be captured strictly with reference to the characteristics of technology. Even in the literature on technology and organization structure, which has argued for the strongest links between the nature of technology and organizational forms, there is a recognition that technological change serves as an occasion for restructuring Barley, (2000), and the same technology can occasion quite different organizational outcomes.

Technological innovation cycles between periods of stability and change. A wide range of technological innovation research suggests that the innovation process fluctuates between periods of relative stability and periods of relative change. Research on innovation and business strategy in particular has argued that the nature of innovation changes over time. Periods of more incremental innovation, in which technology appears to develop along well understood paths, are then abruptly followed by periods of more radical innovation, in which the certainties of the past era are abandoned Utterback, (1994); Tushman & Rosenkopf, (2002).

### **The Meaning and Scope of Organization**

Organization is defined in a number of ways. In the study of management it can refer to the structure of relationships among individuals. A less static approach defines organization as a process or an element of management concerned with change or growth of the structure. So, organization can be defined as a collection of people working together in a division of labour to achieve a common purpose.

The aim of any organization is to produce a good or service. Large and small businesses produce consumer goods and services such as automobiles, appliances, gourmet dining, and accommodations. Non-profit organizations produce services with public benefits such as health care, education and judicial processing. A clear statement of aim is important to guide the activities of an organization and its members.

To achieve its aims, organizations depend on the activities and collective effort of many people. At this respect, people are the main human resources of organizations - the individuals and groups whose performance contributions make it possible for the organization to serve a particular purpose. However, organizations need more than people if they are to achieve their aims, to survive and prosper. They also need material resources including physical equipment and facilities, technology, information, raw materials and money. Organizations require all of these resources in order to produce some useful goods and services.

### **Organizational Performance**

Measuring organizational performance is difficult (Hubbard, 2009). Numerous literatures exist on organizational performance. The earliest research on this topic developed what was known as the shareholders theory. They viewed firms as belonging to shareholders and as such, they concluded that organizational performance can be measured only in terms of

shareholders' returns. This theory agrees with the belief of Prof Milton Friedman who stated that 'the business of firms is to make profit' (Porter, 1980; Owen, 2006; Brown & Fraser, 2006).

Organization performance has been defined as the capability of firm to accomplish its goals and objectives with the help of talented administration, good governance and have a constant rededication to accomplish business objectives Mahapatro, (2013). Organizational performance is a sign which deal how well a business complete its goals. Organizational performance is one of the most key constructs in the research of management (Ho, 2008).

Owen (2006), in agreeing with the shareholders' theory believes that organizational performance encompasses three specific areas of firm outcome: (a) Financial Performance (profits, return on assets, return on investment etc), (b) Product Market Performance (sales, market share etc.) and (c) Shareholders Returns (total shareholders return, economic value added etc.)

The 1990s saw the emergence of the Stakeholders theory (Hobbar, 2009). This theory sees the firm as responsible not only to shareholders, but also to a wider group which includes employees, representatives, customers, suppliers, government, industries, bodies, local communities etc. As such, its performance must be measured by how much it is able to satisfy these stakeholders (Freeman, 1984; Reich, 1998; Post, Preston, & Sach, (2002); Brown & Fraser, 2006; Steuer, 2006). The stakeholder theory assesses organization performance against the expectation of a variety of stakeholder groups that have particular interest in the effects of the organization's activities. Its perspective of organizational performance incorporates stakeholder value, but recognizes that shareholders are just one group of stakeholder and only relevant to those organizations that issue shares (Hubbard, 2009).

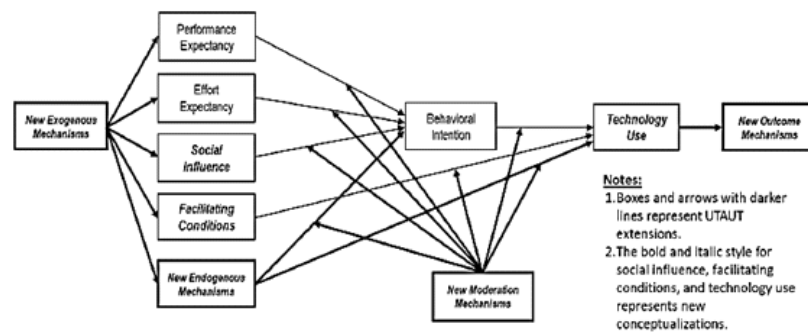
Another concept of organizational performance based on the stakeholders' perspective is the Balanced Score Card (BSC). This incorporates financial, customer/market, short term efficiency and long-term learning and development factors into the measurement of organizational performance.

## **Theoretical Framework**

### **Unified Theory of Acceptance and Use of Technology (UTAUT)**

This study is anchored on the Unified Theory of Acceptance and Use of Technology (UTAUT) posited by Vankatesh, Morris, Davis & Davis (2003). The UTAUT model intends to explain technology acceptance and it is based on eight technology acceptance theories or models. Particularly, the UTAUT extracts from the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behaviour (TPB), the combination of TAM and TPB, the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory (Vankateshet *al.*, 2003). Centrally, the UTAUT model uses behavioural intention as a predictor of the technology use behaviour. The behavioural intention predictors that are included are based on the components of the eight technology adoption models reviewed.

Adding to behavioural intention and use behaviour, the UTAUT model comprise of four constructs which are performance expectancy, effort expectancy, social factors and facilitating conditions. The model also includes four moderating variables: age, gender, education and voluntaries of use. In the model, performance expectancy and effort expectancy and social factors directly affects behavioural intention which along with facilitating directly affects use behaviour.



**Source:** Venkatesh et al. (2003)

### Empirical Framework

Empirical evidence which connects innovation with organizational outcomes such as financial performance abounds in literature. In the study of a business operating in Istanbul, Turkey, Gokmen and Hamsioglu (2011) discovered the existence of a relationship between innovation and organizational performance. Lim, Schultmann and Ofori (2010) studied the effect of innovation on performance of construction firms using data statistical data across 18 Organization for Economic Cooperation and Development (OECD) countries and expert interviews in Singapore. They discovered that due to the fact that construction projects are awarded by clients based on lowest cost, innovation appears to be an unfeasible competitive strategy. However, their study revealed that construction firms can develop their competitive advantage through manipulating innovations that consumers are willing to pay for and innovations that would reduce construction costs. They also recommended that construction firms first utilize quality improvements to exploit consumers' willingness to pay for innovative products. This initiative would enable construction firms to improve their finances for innovation and develop their “brand” in construction products. Sustainable competitive advantage could then be firmly established when construction firms engage in productivity improvements that lead to lower construction costs and/or faster completion times.

Yam, Guan, Pun and Tang (2004) state that technological innovation is the skill involved in realizing and supporting a company's technological innovation strategy. As such, it is a specific asset or resource which includes technology, products, expenditures, processes, knowledge and experience. In their study, they also propose seven dimensions for measuring technological innovation which are: technological learning, R and D, resource allocation, manufacturing ability, marketing skill, organizational skill, and strategic and scale related ability. Archibugi & Coco (2005) point out that technological innovation is the ability to access and digest external knowledge into some unique skill or knowledge, then using it in a dynamic way to improve or develop a new product and launch it successfully. Therefore, it includes capability in product, process and personnel technology.



## Methodology

The study adopted a survey research design which measured two variables, dependent and independent variables. The independent variable is technological innovation which was measured by sub-variables information technology and product innovation while the dependent variable organizational performance was measured by strategic planning capability and marketing capability.

The population of the study is the management staff of Dangote Plc (Ibese branch) which consists of 448 staffs which include the top management staff, senior staff and junior staff. The sample size was calculated using the sample size determination for research activity by Taro Yamane. In estimating the sample size, a 5% margin of error (confidence interval) was used. The sample size for the study therefore is ninety six (96). The next question borders on how the researcher will select 96 management staff out of the population. This question leads us to sample selection method appropriate for this study with respect to selecting the management staff. In this study the probability (or random) sample shall be used because we want every unit (that is management staff) of the study population to be given an equal chance and known probability of being represented in the sample.

The data for the study were collected using both primary and secondary source of data. Primary source of data involve the use of questionnaire, some secondary sources data which include textbooks, journals and online article were also consulted during the literature review. The copies of the questionnaire were distributed to the management staff and the information so collected formed the thrust of the data analysis. Content validity was used for the current study. Cronbach's alpha method of reliability is used for measuring the reliability of this research work. Descriptive statistics which involves the collection, presentation and characterization of a set of data in order to properly describe the various features of that set of data was employed. Hence extensive use of percentages was made.

Also, simple linear and multiple regression analysis in respect to the study hypothesis were used to measure the degree of effects of independent variables on the dependent or outcome variables. After distributing the questionnaire, data would be collected, coded and analyzed through the use of the Statistical Package for Social Science (SPSS). Regression analysis and descriptive statistics would be used to validate the data.

## Results and Discussion

**Table 1:** Reliability Statistics

Cronbach's Alpha	N of Items
.738	18

**Source:** Researcher's Compilation from SPSS

The Cronbach alpha reliability test shows the result of the reliability test of the responses of the respondents to the returned questionnaire, the result shows the Cronbach alpha value of 0.738 which indicates that the respondents responses is highly reliable.

**Table 2: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.400 <sup>a</sup>	.160	.142	.67309	1.911

a. Predictors: (Constant), Product Innovation, Information Technology

b. Dependent Variable: Organizational Performance

**Source:** Researcher's Compilation from SPSS

The table above shows the R square with the value of .160% which indicates that 16.0% variation in organizational performance is caused by the explanatory variables which include Product innovation and Information technology. Also, the adjusted R square indicates that after adjusting the degree of freedom, the explanatory variables can still explain 14.2% variation in the organizational performance. However, the table further reveals the Durbin Watson statistic with the value of 1.911 which indicates that there is no serial auto correlation among the variables.

**Table 3: ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.022	2	4.011	8.854	.000 <sup>b</sup>
	Residual	42.134	93	.453		
	Total	50.156	95			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Product Innovation, Information Technology

**Source:** Researcher's Compilation from SPSS

The F statistic table reveals the overall significance of the model, the probability value of 0.000 which is below the level of significance indicate that we reject null hypothesis and conclude that technological innovation has significant impact on organizational performance.

**Table 4: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.115	.300		3.713	.000
	Information Technology	.405	.097	.399	4.190	.000
	Product Innovation	.050	.093	.051	.540	.591

a. Dependent Variable: Organizational Performance

**Source:** Researcher's Compilation from SPSS

The coefficient table reveals the relationship between the variables which shows that the variables have a positive relationship with organizational performance with 0.405 and 0.050. The table further reveals the significance of the explanatory variables which was however used to test the hypotheses of the study. However, the table reveals that information technology is statistically significant with probability value of 0.000 while product innovation is not significant with probability value of 0.591 with organizational performance at 5% level of significance.

**Table 5: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.549	.275		5.634	.000
	Information Technology	.195	.121	.164	1.607	.111

a. Dependent Variable: Strategic Capability

**Source:** Researcher's Compilation from SPSS

The table above reveals the significant of the variable as well as the relationship between the dependent variable and the predictor. The coefficient result shows that information technology has a positive relationship with strategic capability with the value of 0.195. The significance value of information technology at 0.111 corroborates the conclusion that information technology does not have a significant effect on strategic planning capability employed by organizations.

**Table 6: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.457	.234		6.231	.000
	Product Innovation	.314	.104	.298	3.024	.003

a. Dependent Variable: Marketing Capability

**Source:** Researcher's Compilation from SPSS

The table above reveals the significant of the variable as well as the relationship between the dependent variable and the predictor. The coefficient result shows that product innovation has a positive relationship with marketing capability with the value of 0.314. The significance value of product innovation at 0.003 corroborates the conclusion that product innovation has a significant effect on marketing capability employed by organizations.



**Table 7: Correlations**

		Information Technology	Marketing Capability	Product Innovation	Strategic Capability
Information Technology	Pearson Correlation	1	.302**	-.037	.164
	Sig. (2-tailed)		.003	.720	.111
	N	96	96	96	96
Marketing Capability	Pearson Correlation	.302**	1	.298**	.242*
	Sig. (2-tailed)	.003		.003	.017
	N	96	96	96	96
Product Innovation	Pearson Correlation	-.037	.298**	1	-.094
	Sig. (2-tailed)	.720	.003		.365
	N	96	96	96	96
Strategic Capability	Pearson Correlation	.164	.242*	-.094	1
	Sig. (2-tailed)	.111	.017	.365	
	N	96	96	96	96

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

**Source:** Researcher's Compilation from SPSS

The correlation table shows the relationship between the variables. However, the table shows that information technology has a positive correlation with marketing capability and also statistically significant at 0.05 level of significance. Also, the table reveals that information technology with 0.037 has a negative relationship with product innovation and not statistically significant at 0.05 level of significance. The table further reveals that information technology has a positive but low correlation with strategic planning capability and also not statistically significant at 5% level of significance. Also, marketing capability has a positive relationship with product innovation and also statistically significant with probability value of 0.003. Furthermore, marketing capability has a positive relationship with strategic capability but not statistically significant. Finally, the table shows that product innovation has a weak negative relationship with strategic capability and also not statistically significant with significance value of 0.365.

**Test of Hypotheses**

**Hypothesis I:**

H<sub>0</sub>: Information technology does not have any effect on strategic planning capability

**Decision Rule:** The coefficient table shows that strategic capability and marketing capability with probability value of 0.111 is not statistically significant which denote that we accept null hypothesis and conclude that Information technology does not have any significant effect on strategic planning capability.

**Hypothesis II:**

$H_0$ : Product innovation does not have an effect on marketing capabilities.

**Decision Rule:** Product innovation with probability value of 0.003 is statistically significant which means that we reject null hypothesis and conclude that product innovation has a significant effect on marketing capabilities.

**Conclusion**

This research work examined the extent to which technological innovation affect organizational performance in manufacturing industries with particular focus on Dangote Cement Plc. The findings of the study revealed that the explanatory variables which include information technology and product innovation have positive relationship with organizational performance. The research concludes that there is need for high usage of information technology in order to increase the performance of an organization. Similarly, product innovation has to be increased in an organization in order to enhance performance.

Finally, the explanatory variables which include information technology and product innovation used to measure technological innovation while strategic planning capability and marketing capability which was used to measure organizational performance reveals that there is positive relationship among the variables at a significance level of 0.05. Thus, the study corroborates the assertion that there is need for technological innovation (which serves as a driving force) in an organization.

**Recommendations**

Based on the above findings, the following recommendations are discernible:

- i. Manufacturers should be innovative about their technology so that they can be competitive in the market.
- ii. Organizations should train and re-train their employees so that they can master new innovation in order to be more productive, which will lead to better performance.
- iii. There should be pragmatic strategic planning capability in order to deliver superior performance and ultimately sustained competitive advantage.
- iv. The management of Dangote Plc should embrace marketing capability that can help in the effective and efficient management of marketing mix.

## References

- Archibugi, D., & Coco, A. (2005). Measuring technological capabilities at the country level: A survey and a menu for choice. *Research Policy*, 34, 175-194.
- Barley, S. R. (2000). The alignment of technology and structure through roles and networks. *Administrative Science Quarterly*, (35), 61-103.
- Brown, J., & Fraser, M., (2006). approaches and perspectives in environmental accounting: An overview of the Conceptual Landscape. *Business Strategy and the Environment*, (15), 103– 117.
- Daniels, E. (2002). The dynamic of product innovation and firm competences. *Strategic Management Journal*, 23, 1095-1125.
- Dosi, G. (2005). Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change. *Research Policy*, 11, 147-162.
- Feenberg, A. (1995). *Alternative modernity: The technical turn in philosophy and social theory*. University of California Press, Berkeley, CA.
- Freeman, A. (1984). *Strategic management: A stakeholder approach*. Pitman: Bolton, M. A.
- Galende, J., & Fuente J. M. (2003). Internal factors determining a firm's innovative behaviour, *Research Policy*, (32), 715-736.
- Gokman, A. & Hansioglu, A. B. (2011). Tacit knowledge and its correlation to innovation and performance in obtaining competitive advantage: A Study in a business operating in the Textile Industry. *International Journal of Economics and Administrative Studies*, 4(7), 19– 34.
- Ho, L. A. (2008). What affects organizational performance? The linking of learning and knowledge management. *Industrial Management & Data Systems*, 108(9), 1234 - 1254.
- Hubbard, G. (2009). Measuring Organisational Performance: Beyond the Triple Bottom-line. *Business Strategy and the Environment*, (18), 177 – 191.
- Lim, J. N, Schultmann, F. & Ofori, G. (2010). Tailoring Competitive Advantage Derived from the Needs of Construction Firms. *Journal of Construction Engineering and Management*, 568– 580.
- Mahapatro, B. B. (2013). Organizational performance. *Human Resource Management*, 272- 279.
- Owen, D. (2006). Emerging Issues in Sustainable Reporting, *Business Strategy and the Environment*, (15), 241 – 218.

- Porter, M. (1980). *Competitive strategy*. Freeman Press, New York .
- Post, J., Preston, C., & Sach, S. (2002). *Redefining the corporation: Stakeholder management and organisational wealth*. Stanford University Press, Pato Alto.
- Reich, R. (1998). The new meaning of corporate fiscal responsibility. *California Management Review*, 40(2), 8 – 17.
- Steuer, R. (2006). Mapping stakeholder theory Anew: From the stakeholder theory of the firm to three perspectives of business-society relation. *Business Strategy and the Environment*, 32(15), 55 – 59.
- Tushman, M.L., & Rosenkopf, L. (2002). Organizational determinants of technological change: Towards a Sociology of Technological Evolution. *Research in Organizational Behavior*, 6(14), 311-347.
- Utterback, J. M., (1994). *Mastering the dynamics of innovation*. Harvard Business School Press, Boston, MA.
- Venkatesh, V., Thong, Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the Unified Theory of Acceptance and Use of Technology (UTAUT). *MIS Quarterly*, 36 (1), 157-178.
- Williams, R. E., (1996). *The social shaping of technology"*, in Dutton, W (3<sup>d</sup> eds), *Information and communication technologies: Visions and realities*. Oxford University Press, New York, NY.
- Yam, C. M., Guan, J. C., Pun, K. F., & Tan, P. Y. (2004). An audit of technological innovation capabilities in Chinese firms: Some empirical finding in Beijing, China. *Res. Policy*, 21(33), 1123-1140.
- Zahra, S. A., & Bogner, W. C. (2000). Technology strategy and new venture performance: Examining the moderating role of the firm`s competitive environment. *J. Bus. Venture*, 6(15), 135-173.